JHR 50: 191–196 (2016)
doi: 10.3897/JHR.50.8897
http://jhr.pensoft.net

SHORT COMMUNICATION

JOURNAL OF Hymenoptera RESEARCH
A peer-reviewed open-access journal
The International Society of Hymenopterists

First record of the parasitoid *Gonatopus flavipes* Olmi, 1984 (Hymenoptera, Dryinidae) in Brazil's Amazon forest

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Academic editor: *Michael Ohl* | Received 18 April 2016 | Accepted 8 May 2016 | Published 27 June 2016

http://zoobank.org/3CBFB7D1-2735-47A3-8B87-BDCE8D03642F

Citation: Martins AL, Krinski D (2016) First record of the parasitoid *Gonatopus flavipes* Olmi, 1984 (Hymenoptera, Dryinidae) in Brazil's Amazon forest. Journal of Hymenoptera Research 50: 191–196. doi: 10.3897/JHR.50.8897

Abstract

This study reports for the first time the occurrence of *Gonatopus flavipes* Olmi, 1984 in Pará State, Brazil. Specimes were collected on upland rice crops of Cambará variety in Novo Progresso (7°07'45.71"S 55°23'21.13"W). A sampling of insects with pitfall traps was conducted between November 2010 and March 2011. Specimens of *G. flavipes* were identified, illustrated and deposited in the Entomological Collection of the Department of Zoology, Federal University of Paraná, Curitiba, Brazil (DZUP/UFPR). This record indicates that rice crops may represent important habitats for this species.

Keywords

Chrysidoidea, Gonatopodinae, *Gonatopus* group seven, pitfall traps

Introduction

Gonatopus Ljung, 1810 is one of the 11 genera belonging to the subfamily Gonatopodinae (Hymenoptera, Dryinidae). With about 440 worldwide described species, among which 120 known in the Neotropics and 32 in Brazil (Olmi and Virla 2014; Martins et al. 2015a, b), this genus is divided into 12 groups (nine registered for the Neotropics and five for Brazil) (Olmi and Virla 2014). Little is known about the biology of parasitoids belonging to the genus *Gonatopus*. The few studies report the association of the genus with some families of leafhoppers and planthoppers (Hemiptera, Auchenorrhyncha): Acaloniidae, Caliscelidae, Cicadellidae, Cixiidae, Delphacidae, Dictyopharidae, Flatidae, Issidae, Lophopidae, Meenoplidae and Tropiduchidae (Guglielmino et al. 2013; Olmi and Virla 2014).

Gonatopus flavipes Olmi, 1984, broadly distributed from Mexico to Argentina, belongs to group seven, which is the largest group of *Gonatopus* with exactly 61 described species. Both sexes of *G. flavipes* are known (Olmi and Virla 2014). The following species of Cicadellidae (Hemiptera, Auchenorrhyncha) are reported as hosts: *Mendozellus asunctia* Cheng in Argentina; *Dalbulus maidis* (DeLong and Wolcott) in Piaui, Brazil; *Dalbulus elimatus* (Ball), *Planicephalus flavicosta* (Stål) and *Graminella comata* (Ball) in Mexico (Guglielmino and Olmi 1997, 2006; Meneses et al. 2013; Moya-Raygoza 1990, 1993; Olmi and Virla 2014; Virla 1992).

The Companhia Nacional de Abastecimento do Brasil (CONAB 2016) records rice cultivation in Pará State since 1976–1977, mainly in the North, with recent planting of upland rice in the Southwest (less than 10 years) (Azevedo 2009; Krinski 2014; Lopes et al. 2004; Silva and Magalhães 1981). For this reason, a few entomological studies have been conducted on rice cultivars of this region. This study reports for the first time the occurrence of *G. flavipes* in upland rice crop in Southwestern region of Pará State (Brazil).

Materials and methods

A sampling of insects was conducted with pitfall traps on upland rice crops (Cambará variety), in Novo Progresso, State of Pará, Brazil (7°07'45.71"S 55°23'21.13"W) (Fig. 1), between November 2010 and March 2011. The sampling effort included 16 collecting points visited weekly, covering 400 meters in four transects of 100 meters, distant 25 meters from each other.

The collected specimens of *Gonatopus* were sent to the Laboratory of Comparative Hymenoptera Biology at Federal University of Paraná (UFPR), where they were identified to species level using a stereo-microscope LEICA M125 coupled to digital camera LEICA DFC295. The images were processed by Zerene Stacker software (1.04 version build). Digital scanning electronmicroscope (SEM) photographs were taken with a TESCAN VEGA3 LMU in low vacum mode. The figures were prepared using Adobe Photoshop (version 11.0). Specimens are deposited in the Entomological Collection of the Department of Zoology, Federal University of Paraná (DZUP).

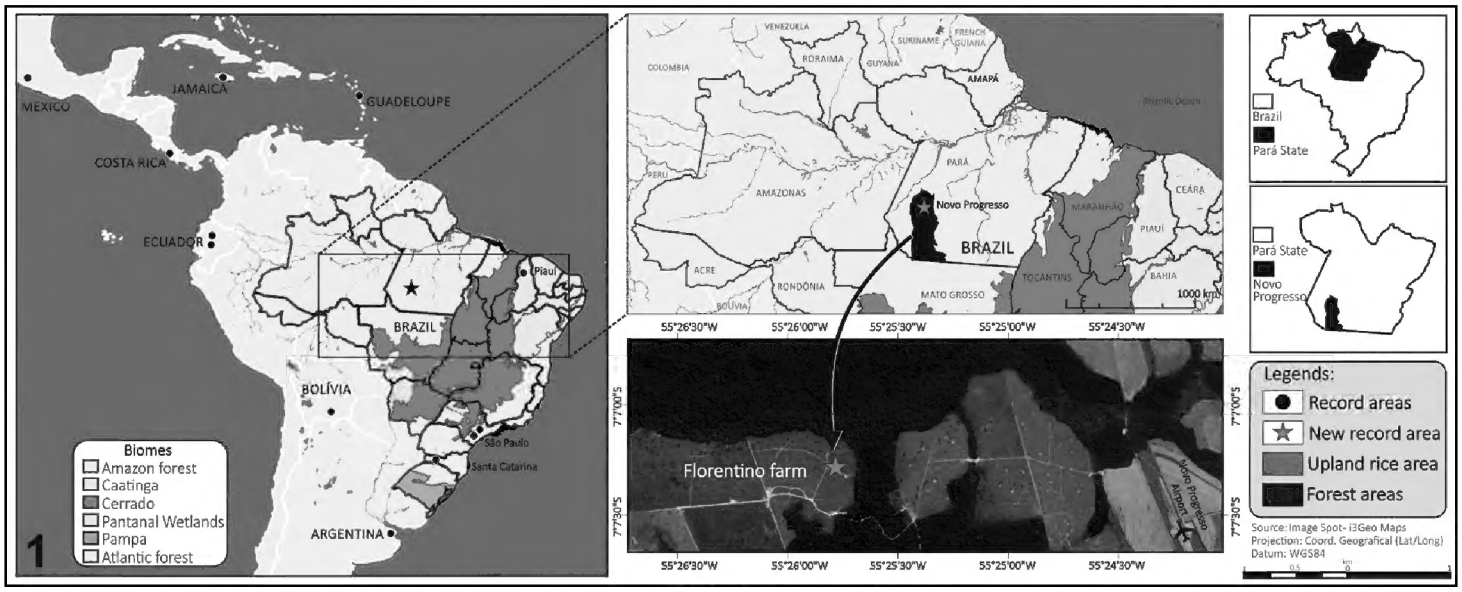


Figure 1. Distribution map of *Gonatopus flavipes*. Black circle: record areas in Argentina, Bolivia, Brazil (Piauí, São Paulo and Santa Catarina), Costa Rica, Ecuador, Guadeloupe, Jamaica and Mexico; Star: new record of occurrence (Florentino farm – municipality of Novo Progresso, Pará State, Brazil). Source: i3Geo (free software). Licensed as General Public License (GNU) and created by Ministry of Environment (MMA).

Results and discussion

Gonatopus flavipes Olmi, 1984

Gonatopus flavipes Olmi, 1984: 1752.

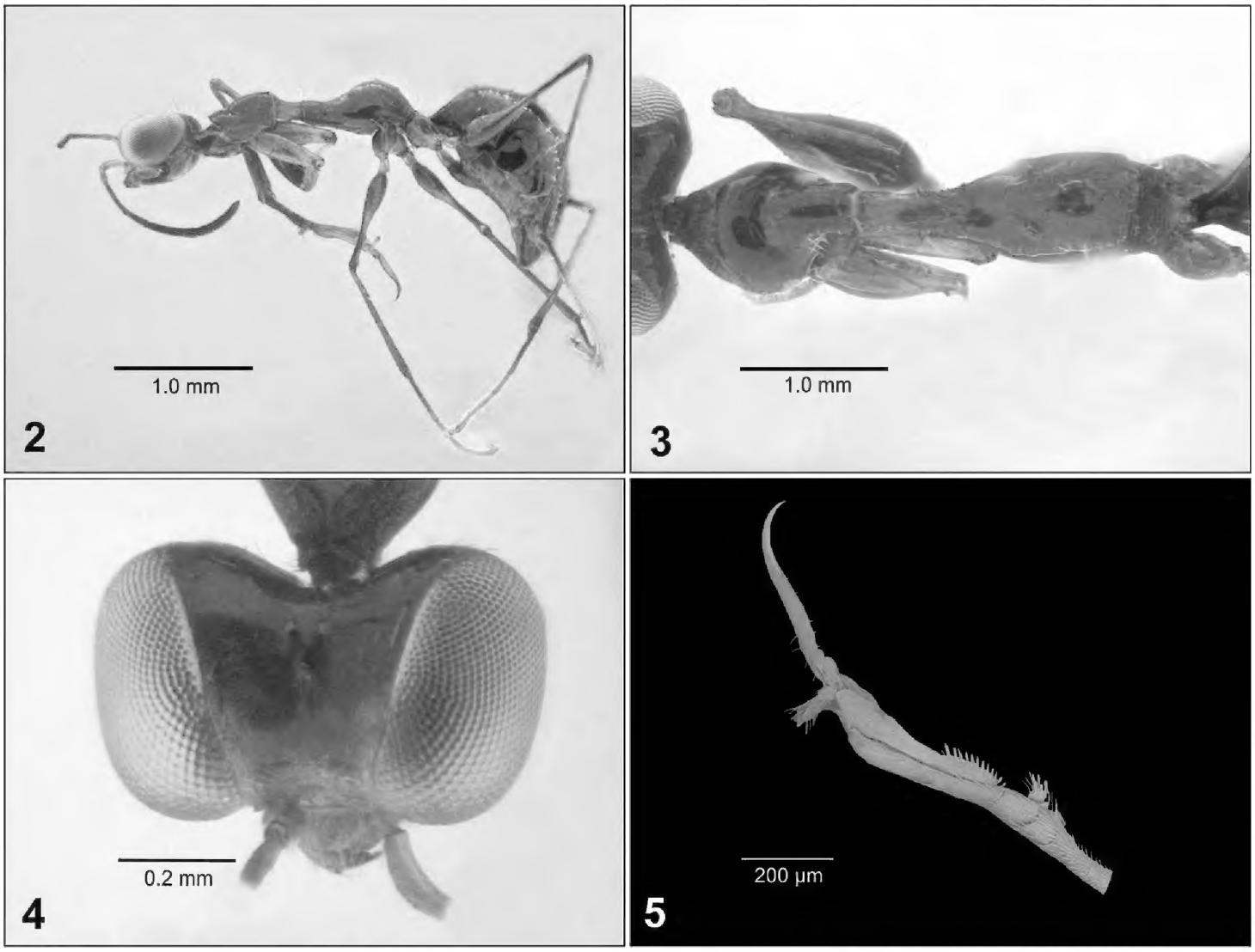
Note. Only two female specimens were collected (Figs 2–5). They present the following diagnostic features:

Diagnosis. Completely yellow testaceous except petiole black and metasoma partly brown (Fig. 2). Pronotum shiny, unsculptured, crossed by strong transverse furrow. Scutum shiny, unsculptured, laterally with two pointed apophyses (Fig. 3). Meso-metapleural suture obsolete (Fig. 2). Head with frontal line complete; occipital carina absent; OL (distance between the inner edges of a lateral ocellus and the median ocellus)/POL (distance between the inner edges of the lateral ocelli) = 1.5/1.0 (Fig. 4). Enlarged claw with one small subapical tooth and one row of six peg-like hairs. Segment 5 of protarsus with two rows of 22 + 12 lamellae (Fig. 5). Tibial spurs 1/0/1.

Material examined. Two females: Brazil, PA, Novo Progresso, Florentino Farm, Upland rice crop, 7°08'41"S 55°22'43"W,09.ii.2011, D. Krisnki, Pitfall traps (DZUP).

Gonatopus flavipes was recorded for Argentina, Bolivia, Brazil (Piaui, São Paulo and Santa Catarina States), Costa Rica, Ecuador, Guadeloupe, Jamaica and Mexico (Olmi and Virla 2014) (Fig. 1). In addition we record for the first time the presence of this species from Pará State, Brazil, in upland rice crop.

Therefore, considering the economic importance of rice crops in Brazil, we recommend careful monitoring in rice areas and studies on the biology, morphology and ecology of *G. flavipes* in different rice crops.



Figures 2–5. *Gonatopus flavipes*. **2** Habitus **3** Mesosoma in dorsal view **4** Head in dorsal view **5** Chela.

In addition, more studies are needed to assess the population fluctuation of this parasitoid in different rice varieties, mainly to investigate if this species can be used in the future for the biological control of Auchenorrhyncha (Guglielmino 2002; Mita et al. 2012). In fact, research out of Brazil have reported the occurrence of *Gonatopus* species associated with important pests of rice (Mita and Pham 2014).

Acknowledgements

Authors acknowledge the farmers of Fazenda Florentino, Marlete Florentino, Eurides Florentino (*in memoriam*), and Nadir de Lima Florentino (*in memoriam*) for allowing this research on their property. We also thank the Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) and the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) for fellowships provided to D. Krinski (CNPq – Proc.: 141243/2012-0 and CAPES – Proc.: 939980) and A. L. Martins (CNPq – Proc.: 142415/2015-4). Many thanks to the Center of Electron Microscopy of Universidade Federal do Paraná (UFPR) for the SEM photomicrographs. Many thanks to Dr. Massimo Olmi (Tropical Entomology Research Center, Viterbo, Italy) for help in the identification of species and for the review of the manuscript.

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